

## The Need for Climate and Health Education

With the increasing understanding that climate change is already affecting and will continue to affect human health,<sup>1,2</sup> health professionals, governments, businesses, and the general public must proactively address both climate change and its implications for public health. The observed and anticipated effects of climate change on human health are myriad and will affect both the vulnerable and the broader public. Examples of direct effects include overall elevated temperatures that generally exacerbate chronic disease morbidity and mortality and changing patterns and increased frequency of heat waves that lead to more acute heat stress–related morbidity and mortality.<sup>3</sup> Some of the indirect outcomes of climate change include alterations of vector-borne disease transmission dynamics, degradation and destabilization of air and water quality, and stress to mental health. More complex downstream effects include disruption of agriculture and food security, reduced water availability, and conflict over limited resources.

Many of these effects will disproportionately affect poorer and more marginalized populations, and strain systems and governments lacking the resources to buffer themselves. Manifestation of these effects is not just a slow creep; the system dynamics of climate change, human health, and their intersection are highly complex and

can produce aberrancies that tax our environmental, economic, and health infrastructures through both gradual change and marked, discrete shifts or events. It is also important to recognize that climate change is a system stressor that further complicates and compounds other societal challenges, including interpersonal and societal conflict, poverty, and rapid urbanization, and that strains economic and societal resilience.

### INVESTING IN CLIMATE AND HEALTH

Clearly, resources must be invested in climate and health research and in the translation of that research into informed best practices and policy. By improving the collective understanding of the science of climate and health, more effective mitigation and adaptation strategies can be designed and implemented. Indeed, future planning of investments as diverse as dam construction, urban expansion, and agricultural practices must include integrated assessments of these projects in light of current and future climate change, their implications for public health, and interactions and feedback within the climate and health nexus.<sup>4</sup>

To carry out such informed planning and analysis, we need a cadre of knowledgeable health

professionals, planners, businesspeople, and governmental officials who understand the interconnection of climate and health. These leaders must have an understanding of the dynamics governing the interactions of climate and health, the state of scientific understanding of these interactions, and, perhaps even more important, a healthy respect for the processes and issues not yet understood. Only through the development of a generation of informed professionals across a variety of fields can society intelligently assess the complexities of climate and health interactions, account for these complexities when planning and making infrastructural investment decisions, and anticipate the unintended consequences of those decisions at multiple levels, including local and municipal.

To meet this need, it is imperative that climate and health education enter the broader curriculum. Health professionals, policymakers, urban planners, engineers, and corporate leaders all need more formal exposure to and education in climate science,

public health, and the ways that climate change and health intersect. Such education should be implemented through university programs—that is, an incorporation into existing curricula in schools of public health, medicine, nursing, dentistry, engineering, agriculture, public policy, urban design, architecture, and business. This list is undoubtedly incomplete but forms a basis for beginning to consider where and how climate and health education should be integrated into existing programs.

### CONSORTIUM ON CLIMATE AND HEALTH EDUCATION

Given the scope of the challenges and opportunities presented by climate change, it is vital that a core set of climate and health educational goals, such as identifying key local effects of climate change on health and working with climate and health vulnerabilities, be articulated and agreed on; that curricula and resources be developed for science-based education on issues residing at the climate–health nexus; and that a network of institutions be built through which communication and

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sharing of resources can be fostered. To begin to meet this need and advance global health security, the Mailman School of Public Health at Columbia University is spearheading the Global Consortium on Climate and Health Education (GCCHE), a worldwide consortium of schools of public health, medicine, and nursing invested in the development and inclusion of health and climate change education in health professions school curricula.<sup>5</sup> This content will be freely distributed.

With funding from the Rockefeller Foundation, the GCCHE was formally launched in February 2017 and builds on momentum generated at a December 2015 COP-21 (Conference of the Parties-21) side event, co-sponsored by the Mailman School and the White House, in which 115 health professions schools from throughout the world, including several from low- and middle-income countries, committed to educate their students on the health effects of climate change. The Mailman School of Public Health invites representatives of all health professions schools to join the GCCHE and to commit to adding climate and health education to their curricula (select the contact button on the Web site<sup>5</sup> to join or request more information).

The GCCHE structure is fundamentally participatory. Member schools provide guidance and feedback to the GCCHE and help direct its initiatives. Initial GCCHE projects include a baseline survey of current health professions school curricula on climate and health, development and implementation of a dedicated Web portal for dissemination of online teaching content, and development of that online content. Our aim is to establish a network of schools that helps

create content and is therefore invested in its broad use as an educational resource. Furthermore, the consortium network will collectively articulate and continually reevaluate expected competencies in climate and health among health professional trainees.

Climate and health education should not be limited to health professional schools. Curriculum is needed for undergraduate programs in public health, earth and environmental science, and sustainable development, to name a few. Executive education programs are also needed to provide senior and mid-level executives, policymakers, and government officials short-course training on the health-related challenges and opportunities from climate change. As part of its longer-term mission, the GCCHE plans to expand its membership and engage in the development of these climate and health education materials and coordinate such efforts with related initiatives.<sup>6,7</sup> For example, content for precollege education, such as provided through the National Institute of Environmental Health Sciences,<sup>7</sup> could be expanded so that future generations are exposed to climate and health science at an early age.

As noted by the *Lancet* Commission on Health and Climate Change, climate change offers an opportunity as well as a threat.<sup>2</sup> That is, the challenges climate change presents afford society the chance to rethink and reformulate the ways in which populations use planetary resources. Society can use the necessity of dealing with climate change as a means for developing a more sustainable and viable habitation of the planet. In developing that path, education will be vital.

Collectively, such efforts will facilitate and accelerate the inclusion of climate and health education curricula, increase societal awareness of the health effects of climate change, and, through these efforts, seed new research pathways, mitigation strategies, and opportunities to improve global health and well-being. This cooperative work can position understanding of climate and health as a foundational part of education and help build the next generation of global expertise needed to create a healthier, more secure future. **AJPH**

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#### CONTRIBUTORS

Both authors contributed equally to this editorial.

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